State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
Northern District

RECREATION USE SURVEY OF BIG GRIZZLY CREEK, PLUMAS COUNTY 2001

Technical Information Report No. 02-1

Prepared under the direction of

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by

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This report was prepared to summarize information collected under the Recreation Planning and Implementation Program to document recreation and fishery enhancement provided by a revised operation of Lake Davis. This report has received only limited review; it is intended for internal use and should be considered preliminary and subject to revision.

January 2002

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SUMMARY

A survey of streamside recreation along Big Grizzly Creek, Plumas County, was conducted in 2001. The purpose of the survey was to estimate the amounts and types of recreation use and angler success occurring along the creek with augmented flow downstream from Lake Davis and Grizzly Valley Dam. Another important purpose of conducting the survey was to document downstream impacts and restoration following the Department of Fish and Game's Lake Davis Northern Pike Eradication Project. The stratified random sample survey combined roving use counts with interviews of recreationists in order to gather information on recreation activities, visitor origin, and angler success.

There were an estimated 4,900 hours of recreation use on Big Grizzly Creek between April 28 and November 15, 2001. The most frequently observed activity in 2001 was relaxing. Fishing, sightseeing, swimming, and walking for pleasure were also common activities. About 15 percent of all visitors came from Nevada and 70 percent of all anglers lived in the northeast counties of California, mostly Plumas County. A large proportion of anglers and visitors lived in the City of Portola. Anglers caught an estimated 170 rainbow trout and about 20 brown trout in 900 hours of fishing.

INTRODUCTION

Big Grizzly Creek below Grizzly Valley Dam offered an opportunity to implement the Department of Water Resources' water management policy, adopted in 1975, which states, "Instream uses for recreation, fish, wildlife, and related purposes shall be balanced with other uses." When Grizzly Valley Dam began operation in 1966, streamflows in Big Grizzly Creek below the dam were increased and stabilized. Minimum flows were increased from about 0.5 cubic feet per second to 8 cfs. Fishing and related streamside recreation were enhanced. An instream flow needs assessment later indicated that increasing flows to 20 cfs would further increase trout habitat over the post-project levels to near optimum levels without significant detriment to lake recreation (Haines 1982).

On a trial basis, Grizzly Valley Dam began a revised operation in June 1982. The Department of Fish and Game and DWR agreed to further revise operating criteria and releases in a 1994 agreement which was first implemented in 1998. Monitoring downstream recreation use, fish populations, and trout catch will document changes to these resources caused by the modified flow release schedules. The agreement further obligated DWR to monitor impacts to reservoir water levels, if any, of this revised operation over the next several years.

The spring of 2001 was dry and runoff to Lake Davis was less than anticipated. Maximum storage was reached April 1 at 57,525 AF (Elevation 5767.64) and gradually declined the rest of the year. Because the Lake did not fill the flow release was held at 10 cfs throughout the trout season except for three days in September when flows were reduced to 5 cfs to permit DFG to monitor the fish population.

This report describes the recreation use survey, creel census, and results for the 2001 trout season, April 28 to November 15. A separate report, prepared by the Department of Fish and Game, Contract Services Section, describes a fish population survey conducted in September 2001 (Brown 2002).

Description of Study Area

Big Grizzly Creek is a major tributary of the Middle Fork Feather River (a designated National Wild and Scenic River) within the Plumas National Forest. The lowest 6.25 miles of the creek is below Grizzly Valley Dam and Lake Davis. From an elevation of 5,670 feet at the dam, the creek drops through steep-walled canyons, flows through the eastern edge of Smith Peak State Game Refuge, crosses under Highway 70 about 2 miles east of the City of Portola, and joins the Middle Fork Feather River on the western side of Sierra Valley at an elevation of 4,870 feet (Figure 1).

Grizzly Road, which also crosses Highway 70, roughly parallels the creek, providing easy access to the mouth of the creek and to Lake Davis. About 3.8 miles upstream from the mouth a dirt road, called Burnham Ranch Road, provides public access to some of the more rugged areas of the creek. This road may be improved in the next few years; private lots are being developed adjacent to the public access area described below.

In 1986, DWR used Land and Water Conservation Funds to purchase a strip of land along Big Grizzly Creek to provide public fishing access. This created a public access area below the dam nearly three miles long, although portions of the surrounding area are privately owned and typically posted against trespass. Overall, about 4.25 miles of the 6.25-mile reach of Big Grizzly Creek below Grizzly Valley Dam is typically used by anglers and other recreationists. The remaining two miles of the creek are generally inaccessible and/or clearly posted against trespass.

Among other things, Big Grizzly Creek provides visitors with opportunities for trout fishing (predominantly rainbow trout), walking and hiking, flora and fauna study, relief from summer heat in the form of swimming and wading, and enjoyment of fall colors. However, public access is prohibited at Walton's Grizzly Lodge, a camp for children at the "Grizzly Ice Pond". The camp uses the pond for fishing and swimming and the surrounding area for other camp activities. Lodge visitor use was not measured and is not included in our estimates.

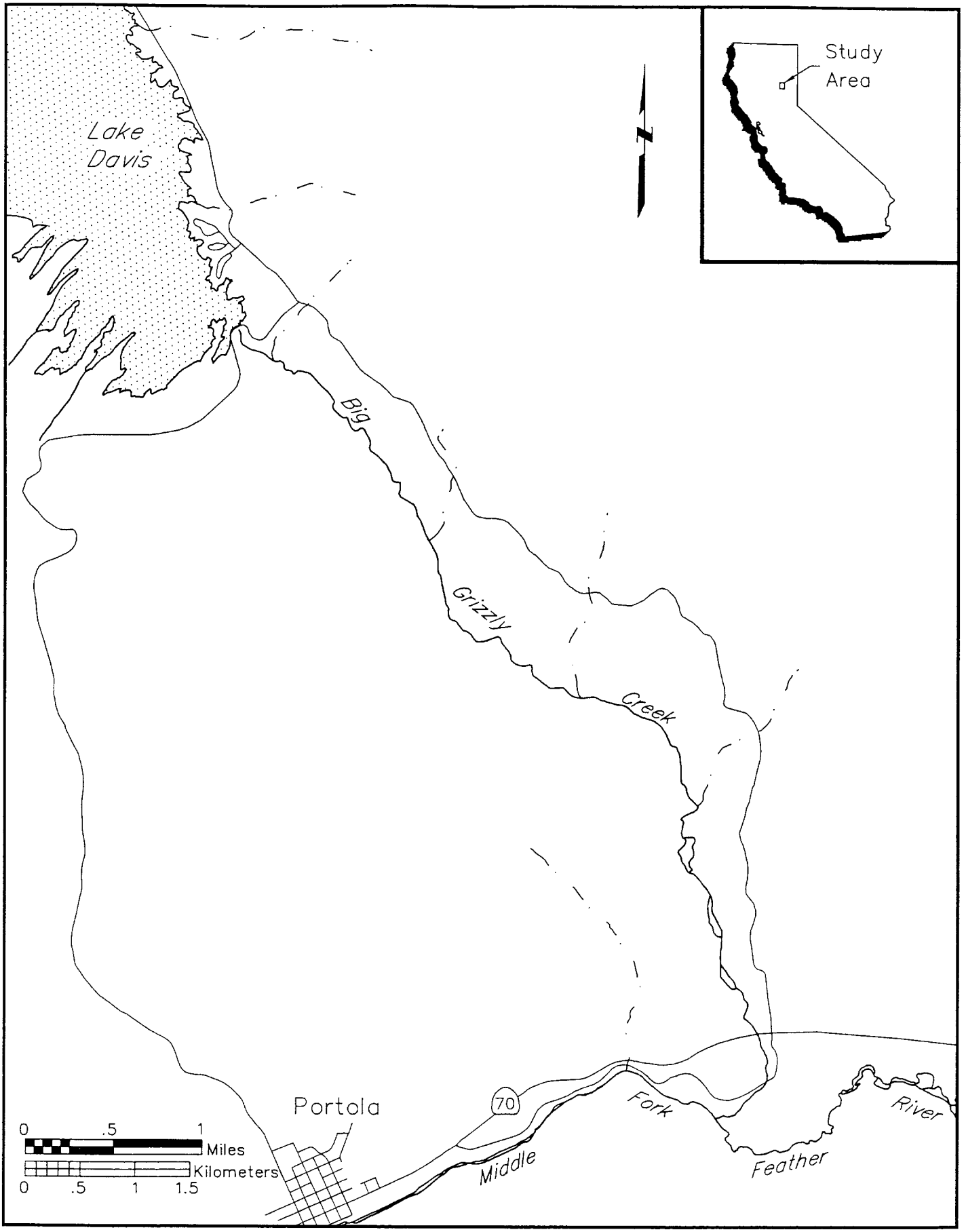

Figure 1. Big Grizzly Creek, Plumas County, 2001.

The general area has a rich history of gold mining, farming and ranching, lumber production, and railroading. In recent decades, recreation use in Plumas County has increased greatly, with water-related uses a major attraction. Employment today is divided among services, government, timber harvesting, ranching, and farming.

Grizzly Valley Dam was built as part of the State Water Project in 1966. Originally planned to supplement irrigation in Sierra Valley, it was completed mainly to benefit reservoir recreation and the fishery downstream in Big Grizzly Creek, and to provide domestic water to the City of Portola. Releases for recreation, fish, and wildlife are based on the water surface elevation on May 1. In addition to the releases for downstream fisheries and water rights, the reservoir is usually operated to prevent spill. This requires large releases of up to 250 cfs in the early spring of some years (DWR 1974), and as a result spill has been negligible since 1986.

In October 1997 the Department of Fish and Game chemically treated Lake Davis to eradicate non-native northern pike. This action and the resultant closure of the lake until July 1998 had both direct and indirect impacts on recreation and fishing use on Big Grizzly Creek. An important purpose of conducting a Big Grizzly Creek recreation use survey in 2001 was to document any lingering effects the project had on recreation use in this area. Leakage of rotonone from Lake Davis killed all trout in Big Grizzly Creek down to the Grizzly Ice Pond. DFG restocked the creek in 1998 and 1999 with fingerling and "sport-sized" rainbow and brown trout plus a few broodstock rainbows and browns in 1999 (Table 1).

Table 1

Trout Planted in Big Grizzly Creek following Chemical Treatment of Lake Davis

	Species	Approximate Number of Fish	Approximate Size	Pounds of Fish
1998	Rainbow Trout Sport-sized	200	2 / pound	100
	Rainbow Trout Indian Creek	30	6-12 inches	Unknown
	Rainbow Trout Eagle Lake Strain	800	2 / pound	400
	Rainbow Trout Eagle Lake Strain	2,000	Fingerling	Unknown
	Brown Trout Sport-sized	450	1.8 / pound	250
	Brown Trout Fingerlings	11,250	Unknown	Unknown
	Brown Trout Indian Creek	20	6-12 inches	Unknown
	Brown Trout Fingerlings	11,250	Unknown	Unknown
1999	Rainbow Trout Sport-sized	500	1.5 / pound	333
	Rainbow Trout Fingerlings	5,500	610 / pound	9
	Rainbow Trout Brood-stock	7	6 pounds	42
	Brown Trout Sport-sized	1,000	1.8 / pound	556
	Brown Trout Fingerlings	1,000	250 / pound	4
	Brown Trout Brood-stock	40	6 pounds	240

METHODS

Recreation Use Counts

Use counts were made on randomly selected dates within nine survey strata using the optimum allocation method described by Abramson and Tolladay (1959). Twenty-eight days of the 202-day period from April 28 through November 15, 2001, were surveyed: both days of the opening weekend of trout season, 4 of 7 holiday weekend days, 11 of 141 weekdays, and 11 of 52 weekend days. Five one-hour counts of recreation use were made in the study area each day at regular periods, scheduled according to the number of daylight hours (Appendices I and II).

The surveys were made from vehicle or on foot, as necessary, to check access and recreation sites. Recreationists were counted and recorded by recreation activity. The five daily counts were totaled and multiplied by factors that accounted for recreation use in the daylight periods not counted. Similarly, the resulting daily figures were expanded to estimate total recreation hours for all days in each stratum. Adding the stratum totals provided an estimate of recreation hours for the study period.

Creel Census

Anglers along Big Grizzly Creek were contacted on 17 of the 28 survey days to determine fishing success (on 11 dates no anglers were found to interview). The county of residence and length of time spent fishing so far that day were recorded for each angler contacted. Fish censused were counted, measured (fork length to nearest 0.5 cm), and identified to species. To determine total catch, the catch per hour was multiplied by estimated hours of fishing for each stratum and the totals for each stratum were summed.

RESULTS

Recreation Use

Total recreation use on Big Grizzly Creek was estimated at 4,900 recreation hours (+/-1,100 hours) for the period April 28 to November 15, 2001. Counts of people along Big Grizzly Creek indicated that, overall, relaxing was the major activity, followed by fishing, sightseeing, swimming and wading, walking, camping, and bicycle riding (Table 2).

Table 2. Recreation Hours by Activity
Big Grizzly Creek, 2001

Activity	Recreation Hours	Percent
Relaxing	1,100	22
Fishing	900	19
Sightseeing	900	19
Swimming and wading	800	16
Walking	500	10
Camping	300	6
Bicycle Riding	300	6
Miscellaneous/other*	100	2
Total	4,900	100

* Includes undefined activities, picnicking, and off-highway vehicle use.

Ninty-seven interviews were conducted on the survey dates, representing 260 people. The interviews revealed what people said they did during their visit. About 88 percent of the visitors to Big Grizzly Creek said they were just relaxing, followed by swimming and wading (45 percent), fishing (31 percent), and sightseeing (15 percent). These percentages add up to more than 100 percent because many people took part in more than one activity during their visit.

About 97 percent of the interviewed visitors were day users (i.e., returned home at night), and 3 percent stayed overnight somewhere in the area (usually at one of the cabins along the creek). Camping appears to be an infrequent activity, but two groups were observed camping on the property purchased by DWR in 1986.

Visitor origin (Figure 2) was predominantly from northeast counties, generally Plumas County (70 percent). Visitors from Nevada, primarily Reno/Sparks, totaled 15 percent of all users. Bay Area visitors made up 7 percent while 5 percent came from Mountain Counties, and 3 percent from other regions of the State.

Creel Census Data and Angler Success

During the 2001 trout season, 67 anglers were contacted. They had fished 113.5 hours, with an observed catch of 22 rainbow trout (Oncorhynchus mykiss) and 6 brown trout (Salmo trutta). In addition, 45 trout were reported to have been caught and released.

Total angling use was estimated at 900 hours (±400 hours), or about 450 angler-days, with an estimated take of 170 rainbow trout and 20 brown trout (0.21 trout per hour). Based on trout reported caught and released, an additional 270 trout were estimated to have been caught and released.

The mean length of 21 rainbow trout measured during 2001 was 24.1 cm (9.5 in) with a range of 15.5 to 33.5 cm (6.1 to 13.2 in; Appendix III). The mean length of 6 brown trout was 27.8 cm (10.9 in) with a range of 22.0 to 34.0 cm (8.7 to 13.4 in; Appendix IV).

Big Grizzly Creek angler origin (Figure 3) was predominantly from the northeast counties (39 percent). Anglers from Nevada, mostly Reno and Sparks, totaled 15 percent. Thirty-two percent of anglers came from the Bay Area, 4 percent came from the Mountain Counties, 4 percent from the Sacramento Valley Counties, 3 percent from the Central Coast counties, and 3 percent from Southern California.

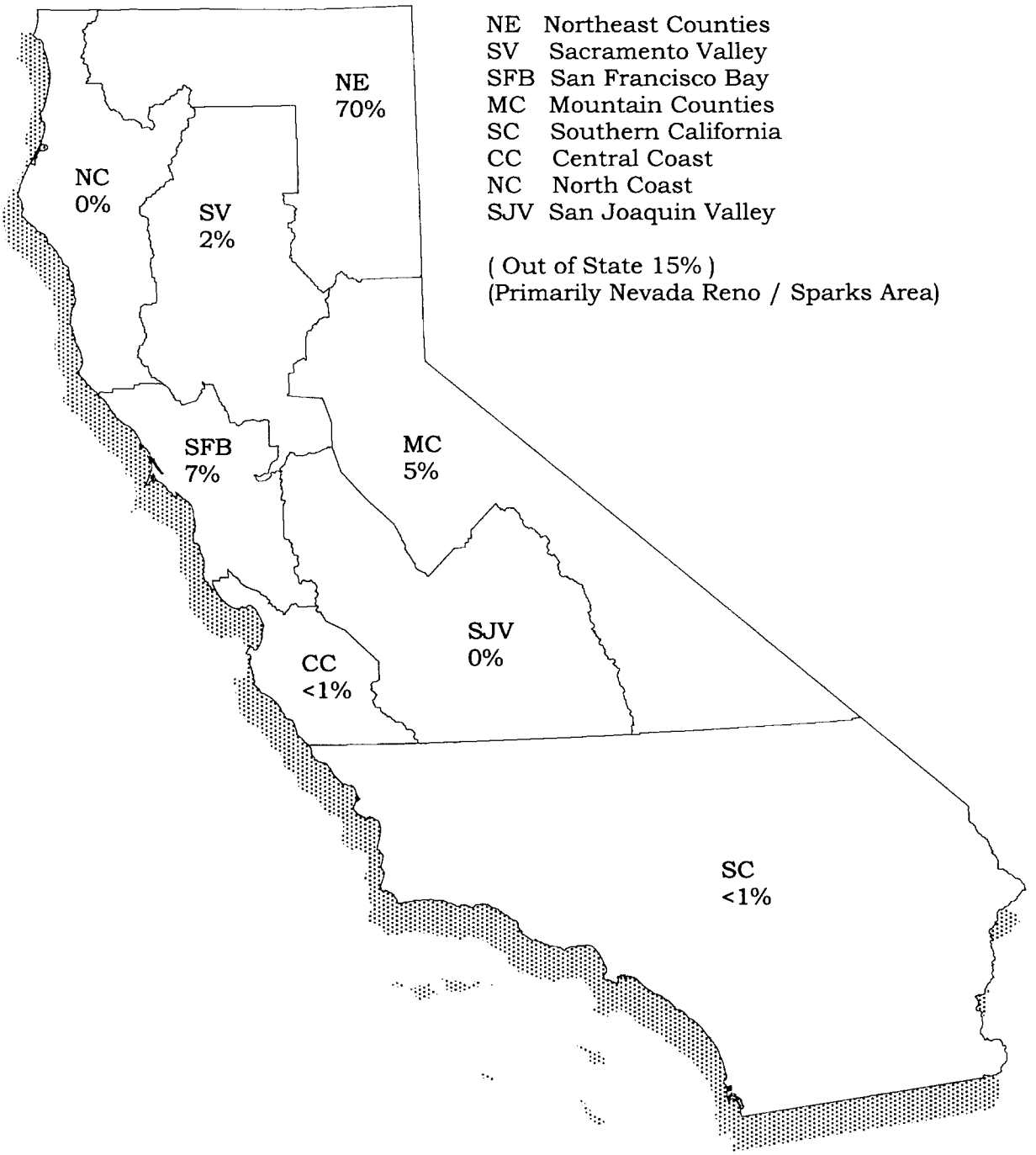

Figure 2 - Big Grizzly Creek Visitor Origin by County Groups 2001

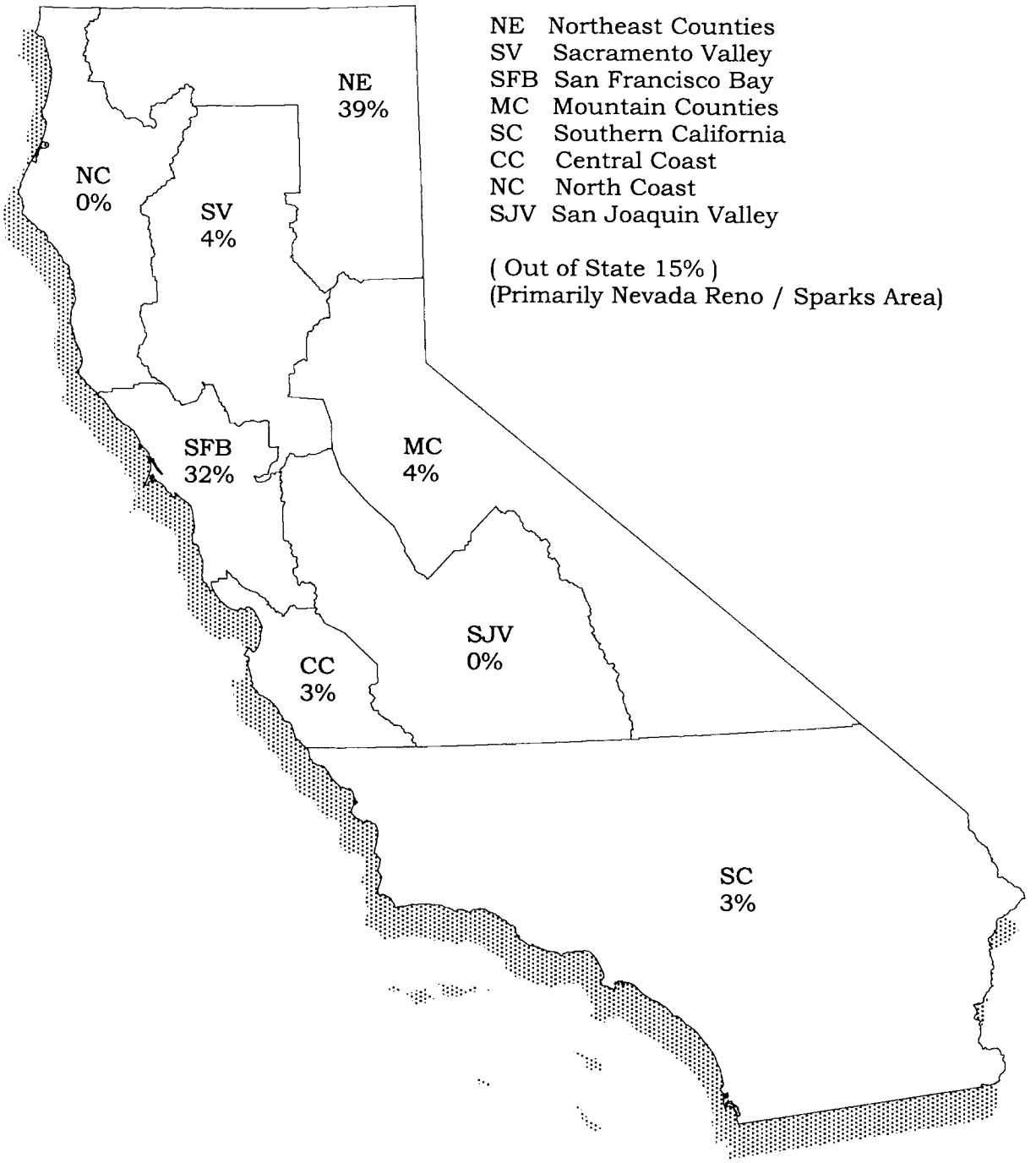

Figure 3 - Big Grizzly Creek Angler Origin by County Groups 2001

About 54 percent of the anglers fished with bait, about 6 percent with lures, and 18 percent with flies, while 22 percent of the anglers used more than one type of terminal gear during their time fishing.

DISCUSSION

Counts and Creel Census

Most people using the creek were readily observed during the use counts. Vehicle access points were checked on each count, and people were found for most vehicles. Vehicles of U.S. Forest Service, DWR workers, game wardens and other non-recreationists are sometimes parked along the road, normally making vehicle counts a poor index of recreation use. About thirteen percent of the estimated fishing use was represented in the creel census.

Comparison With Use in Previous Years

Comparison of the 2001 data with previous surveys conducted on Big Grizzly Creek in 1986, 1991, 1994, 1997, and 1998 (Tittle 1987; J. Brown 1992; Scott 1995; Elkins 1999a; Elkins 1999b) shows a decrease in total recreation use since a peak in 1994. Patterns of recreation use and fishing at Big Grizzly Creek apparently have also changed. The 2001 recreation survey reflected relatively low use, similar to the earliest two studies. Low use in 1998 was most likely attributable to DFG's Pike Eradication Project and the closure of the Lake Davis Recreation Area. Table 3 summarizes differences observed over the years.

During the 2001 trout season, anglers fished an estimated 900 hours, with an estimated catch of 170 rainbow trout and about 20 brown trout. Thus, the fishing use in 2001 was similar to that in 1991 and 1998, but considerably less than in 1986, 1994 and 1997. The catch was next to the lowest observed in the six years surveyed (Table 4). Angler success (trout/angler-hour) has generally declined each year, although success in 2001 showed a small increase over 1997 and 1998. Despite the large numbers of brown trout planted in Big Grizzly Creek in 1998 and 1999, they did not contribute much to the fishery in 2001.

Table 3

Estimated Recreation Hours by Activity, Big Grizzly Creek

Activity	Year					
	1986	1991	1994	1997	1998	2001
Fishing	2,900	800	2,200	1,300	800	900
Swim/Wade	800	1,000	600	*	100	800
Relaxing	200	200	1,000	500	500	1,100
Sightseeing	30	200	2,300	500	300	900
Walking	20	400	1,000	1,000	900	500
Miscellaneous/Other**	450	1,100	1,900	1,700	1,500	700
Totals	4,400	3,700	9,000	5,000	4,100	4,900

* Negligible, included in miscellaneous for that year.
** Includes: picnicking, camping, bicycling, and OHV-use and various undefined activities.

Table 4

Comparison of General Recreation, Fishing Use, and Angling Quality on Big Grizzly Creek

Activity	Year					
	1986	1991	1994	1997	1998	2001
Recreation Use (Hours)	4,400	3,700	9,000	5,000	4,100	4,900
Fishing Use (Hours)	2,900	800	2,200	1,300	800	900
Rainbow Trout Caught (Estimated)	2,300	500	900	200	100	170
Brown Trout Caught (Estimated)	50	0	30	10±	<10	20
Angling Quality (trout caught per hour)*	0.81	0.62	0.42	0.16	0.13	0.21

* Does not include catch-and-release.

Northern pike were discovered in Lake Davis in 1994. Following this discovery the Department of Fish and Game began planning for the eradication of this non-native species. Implementing the plan to chemically treat the lake required several actions that affected Big Grizzly Creek below the dam.

Lake Davis and surrounding recreation facilities were closed to all public use from October 14, 1997 to July 10, 1998. Big Grizzly Creek is not located within this area, but this closure likely had a large impact on recreation and fishing on the creek, even though it was legally open to fishing on April 25, 1998.

The action that had the most direct impact on the creek was the unexpected fish kill in the creek when un-neutralized rotenone escaped through the valve at the dam during the treatment.

The most popular fishing area on the creek, near the confluence with the Feather River, was not affected by the chemical escape, but public perception of chemicals in the stream probably kept some anglers from fishing the creek during the Lake Davis closure. Both rainbow and brown trout, of various sizes, were planted in Big Grizzly Creek in 1998 and 1999 in an effort to restore the fishery.

ACKNOWLEDGMENTS

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APPENDIX 1

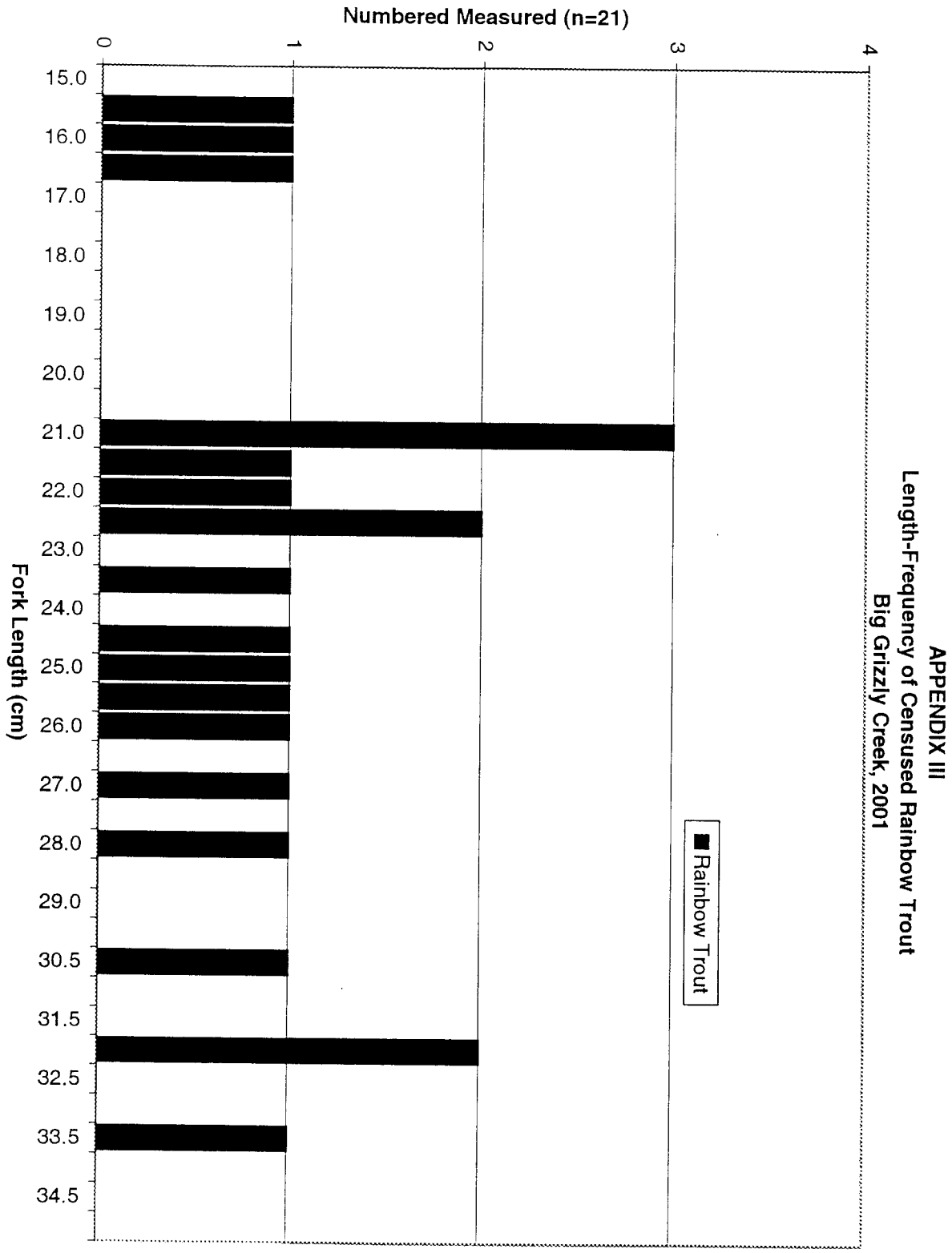
SCHEDULE FOR BIG GRIZZLY CREEK RECREATION SURVEY APRIL 28, 2001 TO NOVEMBER 15, 2001

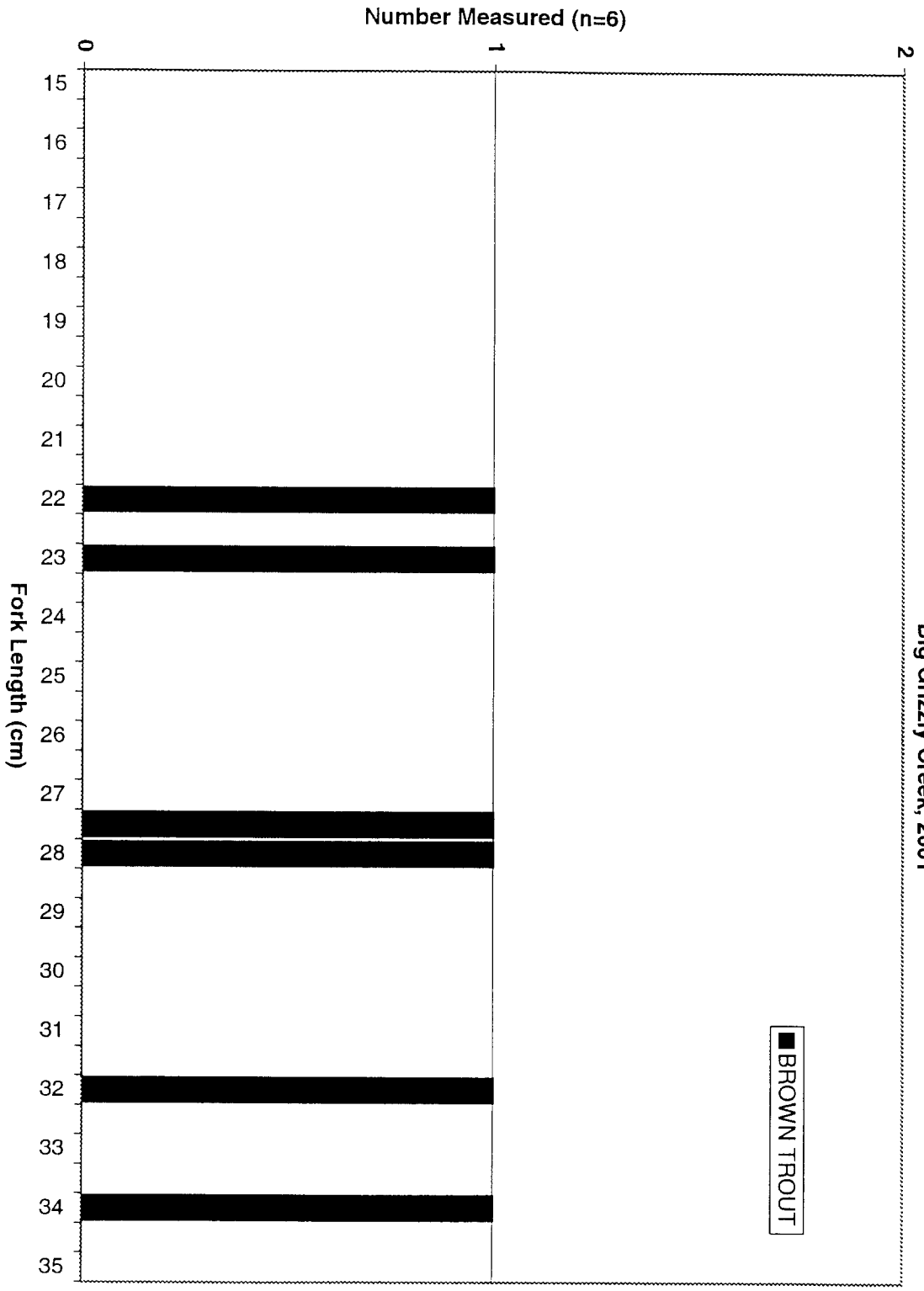
Date	Holiday = HD Weekend = WE Weekday = WD	Survey Stratum
April 28	WE	I
April 29	WE	I
May 10	WD	IV
May 12	WE	III
May 13	WE	III
May 25	WD	IV
May 26	HD	II
May 27	HD	II
June 14	WD	IV
June 16	WE	III
June 20	WD	IV
June 24	WE	III
July 4	WE	IX
July 6	HD	VI
July 8	WD	V
July 14	WE	V
July 17	WD	VI
August 5	WE	V
August 8	WD	VI
August 11	WE	V
August 27	WD	VI
September 2	HD	IX
September 18	WD	VIII
October 20	WE	VII
October 21	WE	VII
October 24	WD	VIII
November 11	WE	VII
November 13	WD	VIII

APPENDIX II

2002 USE COUNT SCHEDULE FOR INDIAN CREEK

Date	Daylight Hours	Use Count		Creel Census Time (approx.)
		Count	Time	
April PDT	15-1/2	1st	0700-0800	0800-1200
		2nd	1000-1100	1500-1900
		3rd	1300-1400	
		4th	1530-1630	
		5th	1830-1930	
May-August PDT	16-1/2	1st	0700-0800	0800-1300
		2nd	1000-1100	1400-1900
		3rd	1300-1400	
		4th	1600-1700	
		5th	1900-2000	
September PDT	14	1st	0730-0830	0930-1300
		2nd	1000-1100	1400-1800
		3rd	1230-1330	
		4th	1500-1600	
		5th	1730-1830	
October PDT	13	1st	0800-0900	0900-1300
		2nd	1000-1100	1400-1800
		3rd	1230-1330	
		4th	1500-1600	
		5th	1700-1800	
November PDT	12	1st	0730-0830	0800-1200
		2nd	0930-1030	1300-1700
		3rd	1130-1230	
		4th	1330-1430	
		5th	1530-1630	


APPENDIX III
Length-Frequency of Censused Rainbow Trout
Big Grizzly Creek, 2001
Numbered Measured (n=21)
0
1
2
3
4
Fork Length (cm)
15.0
16.0
17.0
18.0
19.0
20.0
21.0
22.0
23.0
24.0
25.0
26.0
27.0
28.0
29.0
30.5
31.5
32.5
33.5
34.5
Rainbow Trout



APPENDIX IV
Length-Frequency of Censused Brown Trout
Big Grizzly Creek, 2001